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U.S. Department
of Transportation

Federal Highway Administration

400 Seventh St., S.W.
Washington, D.C. 20590

JAN 20 1995

Refer to: HVH-1

Mr. William Caton
The Secretary
Federal Communications Commission
Washington, D.C. 20554

Re: Reallocation of Spectrum Below
5 GHz Transferred from
Federal Government Use

ET Docket No. 94-32

Dear Mr. Caton:

Since 1991, the Federal Highway Administration (FHWA) has played a key role in researching and testing technologies and services associated with the National Intelligent Transportation Systems (ITS) Program. The goal of the ITS Program is to apply advanced technology to improve travel and safety on our Nation's roadway system. One of the FHWA's areas of interest is the standardization of radio frequencies used for ITS radio communications so that system interoperability across the North American Continent is assured.

We have reviewed the Commission's Notice of Proposed Rulemaking regarding the use of spectrum that has been identified by the National Telecommunications and Information Administration (NTIA) for reallocation to non-government uses. The enclosed comments relate specifically to ITS technologies that can use two bands (2390-2400 MHz and 2402-2417 MHz). We realize that the comment period has closed on this docket, but respectfully request that the Commission consider the FHWA's submission.

Should you have any questions regarding this submittal, please contact Ms. Beverly Russell at 202-366-2202 or Mr. Frank Mammano at 703-285-2405.

Sincerely yours,

Mary W. Euler for

Christine M. Johnson
Director, Joint Program Office for
Intelligent Transportation Systems

Enclosure

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C.

In the Matter of:	)	
	)	
Allocation of Spectrum Below	)	ET Docket No. 94-32
5 GHz Transferred from	)	
Federal Government Use	)	

COMMENTS OF THE FEDERAL HIGHWAY ADMINISTRATION

Christine Johnson
Director, Joint Program Office for
Intelligent Transportation Systems

Federal Highway Administration

Department of Transportation
400 Seventh Street, S.W.
Washington, D.C. 20590

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COMMENTS OF THE FEDERAL HIGHWAY ADMINISTRATION

1. Background

On August 10, 1993, the Omnibus Budget Reconciliation Act of 1993 (the Act) was signed into law. The Act required that the Secretary of Commerce identify 200 megahertz of spectrum currently allocated for use by Federal Government agencies for transfer to the Federal Communications Commission (FCC) for use by the private sector.[1] On February 10, 1994, the Department of Commerce released a report making a preliminary identification of spectrum for allocation. Three frequency bands, 2390-2400 MHz, 2402-2417 MHz, and 4660-4685 MHz, were identified for immediate reallocation.

On November 8, 1994, the Federal Communications Commission (FCC) issued a Notice of Proposed Rulemaking (NPRM), titled *Allocation of Spectrum Below 5 GHz Transferred from Federal Government Use*, detailing the transfer of 50 GHz of spectrum from the Commerce Department.[2] The FCC stated it believes that the allocation of spectrum for private use will benefit the public by providing for the introduction of new services and the enhancement of existing services. The FCC also stated that it seeks to ensure that the spectrum is put to its best and most valued use and that the greatest benefit to the public is attained.

2. The Intelligent Transportation System (ITS) Program

The *Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991* included the *Intelligent Vehicle-Highway Systems Act* (now referred to as ITS) which established a national program to use advanced or state-of-the-art communications, electronics, and information-based technologies to improve the safety and efficiency of the Nation's surface transportation

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[1]The FCC is responsible for spectrum allocation for non-Federal use. The National Telecommunications and Information Administration, which is part of the Commerce Department, manages spectrum for government use, including military.

[2]59 Fed. Reg. 59,393 (November 17, 1994).

systems.[3] The ISTEA also provided substantial funding for the program and emphasized industrial and economic competitiveness as one of the goals of the program.

The private sector and State and local governments will have primary responsibility for ITS deployment. The Federal Government has a critical role in providing strategic leadership for ITS research, testing, and deployment efforts; developing national policy when appropriate; determining solutions to institutional barriers that may impede deployment of ITS; communicating ITS policy goals and objectives to the public; and providing system architecture requirements, which details a conceptual framework of how components interact and work together. The system architecture is critically important to ITS deployment because it serves as a precursor to standards and protocol development. Manufacturers, product developers, vendors, and entrepreneurs will be more encouraged to invest in ITS technology and product development knowing that their system or product meets national standard and protocol requirements.

The national ITS program has been technologically structured around twenty-nine "user services." These twenty-nine user services have been arranged into seven categories, primarily based on commonality of the technology or system. These include:

- **Travel and Transportation Management (includes the following user services: en-route driver information, route guidance, traveler services information, traffic control, incident management, and emissions testing and mitigation)**

The Travel and Transportation Management user services include those technologies that permit collection and processing of information about the surface transportation system, and provide commands to various traffic control devices (e.g., signal systems). Transportation management systems permit real-time adjustment of traffic control devices to adapt to current and predicted traffic conditions that result from special events or incidents. Transportation management applications in selected corridors have reduced delay, overall travel time, and accidents. These applications are being implemented using coordinated signal systems, video surveillance, ramp meters, and variable message signs.

Travel management services disseminate various information to the traveler (e.g., in the vehicle, at work, at home). These services provide real-time or up-to-the-minute information to the traveler on traffic conditions, incidents (e.g., roadway accidents and breakdowns), construction, transit schedules, weather conditions, and routing to users of personal, commercial and public transit vehicles.

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[3] 23 U.S.C. § 307 note.

- **Travel Demand Management (includes the following user services: pre-trip travel information, ride matching and reservation, demand management and operations)**

The Travel Demand Management user services support policies and strategies that are aimed at reducing vehicle demand by developing and encouraging modes of travel other than the single occupant vehicle. The services are designed to increase the use of high occupancy vehicle (e.g., ride sharing) and transit by providing intermodal (transit, carpool and vanpool) information to travelers prior to the beginning of a trip, and by making ride sharing and transit more convenient and easier to use. These services are also aimed at decreasing congestion by altering the timing or location of trips.

- **Public Transportation Operations (includes the following user services: public transportation management, en-route transit information, personalized public transit, public travel security)**

These operations work in conjunction with Travel and Transportation Management to provide mass transit users and operators with the tools to increase ridership and efficiency and thereby lower cost. ITS technologies can be applied to give riders very accurate time-of-arrival information at their stop, to provide passengers with rapid response to medical emergencies, and to better inform commuters of mass transit opportunities that provide convenience and schedule reliability that rival those of the personal automobile.

- **Electronic Payment**

The Electronic Payment service will foster intermodal travel by providing a common electronic payment medium for all transportation modes and functions, including tolls, transit fares, and parking. The service provides for a common fee and payment structure using "smart cards" or other technologies.

- **Commercial Vehicle Operations (includes the following user services: commercial vehicle electronic clearance, automated roadside safety inspection, on-board safety monitoring, commercial vehicle administrative processes, hazardous material incident response, commercial fleet management)**

Commercial Vehicle Operations (CVO) expedite deliveries, improve operational efficiency, improve incident response, and increase safety. CVO reduce regulatory burdens on commercial operators and fleets through capabilities such as weigh-in-motion, automated toll collection, automated driver and vehicle permitting, and vehicle tracking. Because of the immediate economic advantages of these systems, their implementation has led other ITS areas by several years. The accelerated implementation of CVO services has been due in

large part to the fact that frequencies have been available to support them. Simple, low-cost systems have evolved that serve the needs of commercial operators (including public safety).

- **Emergency Management (includes the following user services: emergency notification and personal security, emergency vehicle management)**

Police, fire and rescue operations can use emergency management services to improve their management of and response to emergency situations. These user services have common functional elements such as vehicle location, communications, and response.

- **Advanced Vehicle Control and Safety Systems (includes the following user services: longitudinal collision avoidance, lateral collision avoidance, intersection collision avoidance, vision enhancement for crash avoidance, safety readiness, pre-crash restraint deployment, automated highway systems)**

These systems are vehicle- and roadway-based devices that enhance the control of a vehicle by facilitating and augmenting driver performance. The systems provide safety and warning messages within vehicles (i.e., through computer-generated systems or other electronic functions), and support in-vehicle signing (i.e., seeing a picture of upcoming traffic and warning signs on a screen in your vehicle as you travel down the roadway) which grows in importance as our driving population ages. In the future, these systems may even relieve the driver of most routine driving tasks on designated, instrumented roadways.

Comments:

1. Automated Vehicle Identification (AVI), Automatic Vehicle Monitoring (AVM) and Automatic Vehicle Location (AVL) systems - now collectively referred to as Location and Monitoring Systems (LMS) - form a critical set of core requirements for ITS deployment that depend on radio communications. For example, the single most important component of any transportation management system is surveillance. LMS are an important surveillance capability in a regional traffic management design.

2. Most of the current systems, primarily Electronic Toll and Traffic Management (allows a vehicle to pass a toll without stopping by using what is called a transponder reader for toll collection), operate in the 902-928 band. The FHWA would like to emphasize the importance of continued frequency support for ITS system in the 902-928 MHz band for approximately the next 15 years. There are many Electronic Toll and Traffic Management (ETTM) systems in operation in the band, and a few LMS systems are being developed there. State and local jurisdictions have made *significant* investments in the ETTM systems. Further, there may be a need to expand some of the current systems to cover adjacent geographic areas, and these would have to use

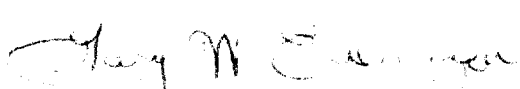
the same band. It is thus essential that the ITS program have spectrum support that would (1) protect the investment in 902-928 MHz systems for at least 15 years (until the cost of technology at 5.8 GHz falls to "consumer" levels, and a cost-sensitive transition can be made by operating jurisdictions) and (2) allow current, installed systems to be expanded into *adjacent* geographic areas, but still subject to the 15-year protection limit.

3. In order to define a system architecture for nationwide ITS, the FHWA awarded four competing contracts to architecture developers for the first phase of the project. A second phase, after a down-select to one or two contractors, will begin in early 1995. The architecture teams have identified some spectrum requirements for ITS, and FHWA has had independent efforts underway to look at spectrum as well. These efforts support the comments below.

   - The FHWA and the ITS System Architecture teams ("Teams") have concluded that the interference environment and capacity of the 902-928 MHz band in which current LMS systems operate are such that additional spectrum is essential for these services. A requirement for 6 MHz in this band has been established by the Teams, which is seen as problematic in the future because of multiple wide- and narrow- band users in the band and the low allocation priority of LMS. Hardware is now available in the 2.4 GHz region to perform some of these services in the very near term, but the capacity of available spectrum in this range will not meet all long-term needs. In fact, a recent attempt to obtain licenses to deploy a 2.45 GHz ETTM system failed because of frequency congestion in that ISM band. It is thus evident that more spectrum, up to 50 MHz in the Teams' estimate, is needed near 2.4 GHz outside of the Industrial, Scientific and Medical band (which includes such products as microwave ovens).

   - The FHWA requests that one of the two bands near 2.4 GHz (2390-2400 MHz), that are included in the reallocation under discussion in this NPRM, be allocated to ITS LMS, FIXED, and MOBILE "Radio Services" (we recognize that LMS is not a Radio Service, as such). This 10 MHz bandwidth will be utilized for short-range vehicle to roadside communications.

Respectfully yours,



Christine M. Johnson
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